

# Quarton Lake Improvement Project

Birmingham, Michigan

Published by the Quarton Lake Project Team

## **Project Purpose**

*The purpose of the Quarton Lake Improvement Project is to improve water quality and lake ecology while enhancing its aesthetic value and providing improved public access and recreational opportunities.*

### *Project objectives include:*

- *Lessen the impacts of erosion by providing shoreline stabilization*
- *Reduce downstream sediment loading by removing accumulated sediment in Quarton Lake and installing a sediment trap at the upstream end of the lake*
- *Remove nuisance fish and plant species*
- *Enhance habitat by establishing fish habitat features in the lake*
- *Develop a recreation master plan for the park*

## **Project Team**

*The project team includes members of a resident ad hoc committee, city staff and consultants. In December 2001, the Birmingham City Commission appointed the Quarton Lake Ad Hoc Committee to help guide city staff in project development. The committee is a cross-section of the community comprised of seven members.*

*Beth Gotthelf, Resident, Chairperson  
Donald Carney, Jr., City Commission  
Art Stevens, Parks and Recreation Board  
Mark Hester, Quarton Lake Association  
Jarad Rundell, Mill Pond Association  
Thomas Elliot, Resident  
Edward Schulak, Resident*

*Dennis Dembiec, Director of Eng and Public Service  
Bob Fox, Asst. Director of Eng and Public Service*

*Support provided by:  
Hubbell, Roth and Clark  
Wade-Trim*

*The purpose of this newsletter is to provide a clear and continuous communication between the project team and Birmingham residents about the status of improvements at Quarton Lake.*

*If you have any questions regarding the project or would like additional information, please contact Dennis Dembiec at [ddembiec@ci.birmingham.mi.us](mailto:ddembiec@ci.birmingham.mi.us) or 248.644.1800.*

## **Dredging Alternatives**

At this time, two primary dredging techniques are being considered to accomplish the goal of improving water quality and ecology at Quarton Lake: Conventional Excavation and Floating Dredge Excavation. Each of these methods has various pros and cons that the Ad Hoc Committee is currently reviewing and will discuss in greater detail at their next meeting. It is currently estimated that approximately 30,000 cubic yards of sediment will be removed (revised from last months estimate of 42,000 cubic yards and based on more accurate topographic data). When the lake was dredged in 1972, 72,000 cubic yards of sediment were removed utilizing conventional excavation with a "bucket" technique.

### **Conventional Excavation**

Also known as "dry" excavation, this method requires all of the water to be drained from the lake to expose as much of the lake bottom as possible. By exposing the lake bottom to sun and air, the sediment will dry sufficiently to allow track excavators and dozers to remove the sediment. This exposed sediment will have an odor until it is dry and able to be removed. The excavated sediment would then be transported via truck to a disposal facility. This method would allow the lake bottom to be graded to the design elevations and any special landforms, structures and/or plantings can be installed and visually inspected.

Conventional Excavation requires the base flow of the river to be managed. There are two primary methods of managing the river flow: Pump and Pipe Bypass and Maintained River Channel.

Pump and Pipe has the capacity to divert the base flow through the pipe with generators. There are "GreenPower" generator systems that incorporate advances in spill containment, silencing and emissions that would allow safe and quiet operation in a residential setting. If this method is selected, bypass pumps would likely be placed in the vicinity of the Oak Street Bridge with temporary pipes placed along the edge of Lakeside Drive and the flow discharged below the Quarton Lake Dam.

Maintaining a river channel through the lake bottom and allowing the base flow of the river to continue to flow during the construction period is another method of managing the water. This option would require sufficient erosion and sedimentation control to prevent sediments from leaving the lake area. This technique would allow storm events to pass through the project area with minor disruption to construction activities.

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### *Floating Dredge Excavation*

This method of excavation utilizes a large pump on a floating platform with a submerged "cutter head" that agitates the lake sediment and creates a slurry mix. The slurry can then be pumped through the floating platform and into a "decant" structure. The decant structure can be a holding pond or dewatering bags. Once sufficiently dried, the slurry mix can then be transported by truck to an off-site disposal facility.



This method requires sufficient water depth to float the dredge and allow the cutter head to be submerged. It also involves more specialized equipment than the conventional dredging method, which a limited number of contractors have in their fleet. The lake can only be partially drained if utilizing a floating dredge and extensive sedimentation control mechanisms have to be installed. These control efforts ensure sediments are not transported downstream. The bypass mechanism of the dam would be utilized or a temporary siphon could be constructed to allow water to flow past the dam.

Because the lake is not completely drained, visual inspection and awareness of the lake bottom is limited making the installation of special landforms, structures and plantings more difficult to install and inspect.

When utilizing the floating dredge technique, the time frame for project completion is controlled by the size of the dewatering area that is available.

### *Methods of Drying Material*

Just as there are various techniques available to dredge sediment from lake bottoms, there are also several methods of dewatering and drying the sediment that has been removed. These methods were briefly discussed at the February Ad Hoc Committee meeting and will be discussed at greater length at the March meeting. Dredged material must be dry enough to meet landfill criteria and efficiently and cost effectively place into trucks for transport to an off-site disposal facility. The greater the moisture content, the more costly to haul the sediment off-site.

#### *Dewatering Bags*

Material from a dredge pump can be conveyed to land through pipes that eventually pump the slurry mix into large filtering and dewatering fabric bags. At a point between the dredge and the dewatering bag, a dosing station injects a flocculent into the slurry mix which speeds up the dewatering process. The bags are filled with the slurry mix and are designed to allow clear water to slowly filter out of the slurry. After a certain period of time, the bags are opened and the material loaded onto trucks for off-site disposal. Dewatering time is dependent on temperature, humidity, polymer additives and sediment composition.

#### *Constructed Lagoons*

Dredged material can be pumped into containment lagoons that provide an area to dry the material. Multiple lagoons are constructed to allow one lagoon to be filling while one is drying and another is being emptied. At the conclusion of the project, these temporary lagoon areas are restored.

#### *Dry Excavation*

After the lake drawdown process is complete, earthmoving equipment enters the project site and begins to remove sediment material. Backhoes can excavate from areas that have some water remaining. Track dozers push sediment material into "wind rows" and a flocculent is applied to decrease drying time. This process can occur on the existing lake bottom, thus minimizing the disrupted area and facilitate capture and treatment of water draining from the excavated material.

### *Initial Sampling Results*

As part of the Rouge Program Office (RPO) Grant requirements, a pre- and post-construction sampling and monitoring program must be approved and conducted. Initial pre-construction sampling on Quarton Lake and upstream to Endicott Lake, began in November and December of 2001. Results to date are based only on this one sampling session. More sampling, at already determined points in the system are planned for the coming months and will continue after project completion.

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### *Water Quality*

Initial water quality results indicate that the lake is suitable for partial body contact. Variables that were tested include turbidity, nutrients, temperature, PH, oil and grease, dissolved oxygen, E. coli, alkalinity, etc. As additional data is collected, more detailed conclusions can be made in regard to what the lake will likely support in terms of plants and fish.

### *Sediment Quality*

To understand the dredged material disposal alternatives and to determine whether further sediment sampling is required, preliminary sampling was conducted at up-stream and downstream locations within Quarton Lake. Samples were analyzed for physical characteristics and chemical waste characterization. PCB's, pesticides, herbicides, and inorganic parameters required by landfill companies were not detected. Some total metal concentrations appear high both upstream and downstream compared to water quality standards, although do not present a problem with landfill disposal.

Based on the initial results of the sediment analysis, there are two primary options for disposal of the dredged material: on-site use and landfill disposal.

The quality of the sediment appears to be appropriate for reuse on-site. This option has the ability to significantly reduce trucking and disposal costs. Possible beneficial uses for a portion of the sediment may include landscaping areas or the creation of off-shore islands, shallow marsh areas and areas for erosion control and fish habitat. It was agreed by committee members that there will have to be a balance between tolerable odor of the spoils used on-site versus the amount of usable materials. The magnitude of how much sediment can be used on-site given the proximity of the neighborhood will be a determining factor. The MDEQ must approve the use of material on-site and will establish restrictions on how sediment is used and/or disposed of.

The second option is to dewater and then truck the sediment to a landfill. This option is costly because of strict dewatering requirements and variable trucking and landfill costs. At this time, it's anticipated that approximately 2/3 of the sediment will need to be disposed of in a landfill.

## *Goals and Strategies for Recreation Improvements*

The purpose of these statements is to help guide the development of a recreation concept master plan for Quarton Lake. These will be used throughout the project to ensure proposed improvements remain focused and in line with the overall vision for the site.

### **Goals**

To provide passive, resource-based recreation to people of all ages that offers a peaceful, serene setting while encouraging interaction with the natural environment.

Involve the public in the programming and design of recreation elements to ensure the park becomes a reflection of the community and residents hold enthusiasm, pride, and responsibility for the park.

### **Strategies**

- Develop a sustainable treatment for the narrow, eastern shoreline. Transform eroded/unstable shorelines with restored, natural shorelines, providing public access where appropriate.
- Develop a shoreline treatment that discourages geese and other waterfowl from sustained browsing and flocking.
- Develop a Lake Use Plan as part of the Master Plan that delineates appropriate activity areas on the water.
- Create a natural setting that balances access with restoration of the open water and shoreline habitats.
- Maximize opportunities for education and interpretation in planning improvements.
- Develop a design standard for the improvements that fits the quality and uniqueness of the surrounding neighborhoods.
- Balance public use with the natural resources of the lake and environs.
- Provide pedestrian connections within the park as well as with other parks and community amenities.
- Keep the on-site reuse of dredged sediment at the forefront of conceptual design decisions.

## *Anticipated Project Schedule*

Public Workshops with Ad Hoc Committee	January - June 2002
Construction Drawings for Environmental/Dredging Work	February - July 2002
Final Recreation Master Plan for Quarton Lake Park	July 2002
Bid Environmental/Dredging Work	September 2002
Construction Drawings for Recreation Work	September 2002 - November 2002
Environmental and Dredging Work Conducted	October 2002 - March 2003
Bid Recreation Work	January 2003
Recreation Work Conducted	March 2003 - September 2003

## *Upcoming Ad Hoc Committee Meetings*

All Ad Hoc Committee meetings are open to the public. All meetings will be held at 6:30 pm at the Department of Public Services Building. The following is a tentative meeting schedule, please look for additional announcements or call City Hall for confirmation of meeting dates and times.

**Tuesday, March 26, 2002**

**Monday, May 6, 2002**

**Monday, June 3, 2002**

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